Forging Machine Setters, Operators, and Tenders

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What They Do

The forging process has come a long way from the days of hammer and anvil. Forging is a technique where metal is heated, and then pressed, pounded, or squeezed under great pressure into strong parts known as "forgings." The forgings are used in the manufacturing process where reliability and human safety are vital, such as aircraft or auto parts.

Forging Machine Setters, Operators, and Tenders set up, run, and tend forging machines that taper, shape, or form metal or plastic parts. They make products as diverse as steel spindles for trailer axles, drill pipes for oil or gas applications, titanium bulkheads for aircraft, and fishing reels. They are mostly employed in the forging and stamping industry, aerospace, and plastics product manufacturing firms.

Tasks

- Read work orders or blueprints to determine specified tolerances and sequences of operations for machine setup.
- Confer with other workers about machine setups and operational specifications.
- Operate gas or oil furnaces to heat metal to proper temperature prior to forging.
- Install, adjust, and remove dies, synchronizing cams, forging hammers, and stop guides, using overhead cranes or other hoisting devices, and hand tools.
- Start machines to produce sample workpieces, and observe operations to detect machine malfunctions and to verify that machine setups conform to specifications.
- Set up, operate, or tend presses and forging machines to perform hot or cold forging by flattening, straightening, bending, cutting, piercing, or other operations to taper, shape, or form metal.
- Select, align, and bolt positioning fixtures, stops, and specified dies to rams and anvils, forging rolls, or presses and hammers.
- Position and move metal wires or workpieces through a series of dies that compress and shape stock to form die impressions.
- Turn handles or knobs to set pressures and depths of ram strokes and to synchronize machine operations.
- Place metal pieces in furnaces, then remove them, using hand tongs or overhead cranes, when metal color indicates proper forging temperatures.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

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Important Skills, Knowledge, and Abilities

- Operation and Control — Controlling operations of equipment or systems.
- Installation — Installing equipment, machines, wiring, or programs to meet specifications.
- Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Design — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
- Control Precision – The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

Work Environment

Most Forging Machine Setters, Operators, and Tenders work in areas that are clean, well lit, and well ventilated. Forging areas tend to be hot for workers, and extra precaution against burns is needed when working with metals. Their work requires stamina because they are on their feet much of the day and may do moderately heavy lifting. These workers operate powerful, high-speed machines that can be dangerous if strict safety rules are not observed. Most operators wear protective equipment, such as safety glasses and earplugs, to protect against flying particles of metal or plastic and against noise from the machines.

Most workers in the occupation put in a 40-hour week, and overtime is common during periods of increased production. Large firms may have 24-hour per day operations that require three work shifts. Many forging plants are nonunion, however some workers belong to unions, such as the International Association of Machinists and Aerospace Workers.

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Forging Machine Setters, Operators, and Tenders (Metal and Plastic)				
51-4022	2,200	2,200	30	$11.86 to $19.43

Wages do not include self-employment.
***Average annual openings** include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

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Trends

The number of Forging Machine Setters, Operators, and Tenders is expected to remain stable between 2004 and 2014 compared to all occupations. This is partly due to the increased use of process simulation software and computer-controlled forging machines that reduce the number of forging errors. The need to replace workers who leave because of retirement or other kinds of work will add job opportunities contributing to an estimated 30 openings per year within the state.

Training/Requirements/Apprenticeships

According to the Forging Industry Educational and Research Foundation, training on forging machines is generally done in the shop and on the job. For the most part, beginning workers are first given tasks away from the forging machine before being trained to set up, run, and tend the equipment. The Bureau of Labor Statistics says, on average, Forging Machine Setters, Operators, and Tenders need between 3 and 12 months of combined on-the-job experience and informal training to do their job competently.

Recommended High School Course Work

High school students interested in forging machine work should take mathematics, such as geometry and trigonometry, metal shop, and chemistry. Computer skills will be helpful for those who want to work on computer-controlled forging machines.

Where Do I Find the Job?

Direct application to employers who run forges remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search under the following industry names to get a list of private firms and their addresses:

- Aircraft
- All Other Plastics Product
- Custom Roll Forming
- Employment Placement Agencies
- Guided Missiles and Space Vehicles
- Iron and Steel Forging
- Metal Stamping
- Nonpackaging Plastics Film and Sheet
- Other Aircraft Parts and Equipment
- Professional Employer Organizations
- Temporary Help Services
- Urethane and Other Foam Product

Search these **yellow page** headings for listings of private firms:

- Die Makers
- Metal Cutting
- Metal Fabricators
- Metal Rolling and Forming
- Metal Stamping
- Plastic Fabricators
- Sheet Metal Work
- Tool Designers

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Where Can the Job Lead?

Forging is a small and very specialized segment of the manufacturing production. Advancement for these workers typically comes in the form of higher wages. Some forging machine workers who have years of experience and can demonstrate leadership skills may promote to shift supervisor.

Other Sources of Information

Forging Industry Association
www.forging.org

Forging Career Center
www.forgingcareers.org

International Association of Machinists and Aerospace Workers
www.iamaw.org

National Institute for Metalworking Skills
www.nims-skills.org

Precision Metalforming Association Educational Foundation
www.pmaef.org

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